Claims:

1. A multi-stage watermarking process comprising the steps of:

creating a watermark specification which describes how to generate a watermark;

generating a template specification which describes how to merge the watermark into a target document;

generating the watermark based on the watermark specification; and

merging the watermark into the target document based on the template specification to provide a watermarked document.

2. The multi-stage watermarking process of claim 1, wherein the watermarked document provided by merging the watermark into the target document is at least one of correspondence, books, magazines, journals, newspapers, forms, software, photographs, images, audio clips, video clips, multimedia presentations, and multimedia products.

3. The multi-stage watermarking process of claim 1, wherein the watermark specification created includes content information which describes content to be in the watermark.

4. The multi-stage watermarking process of claim 3, wherein the watermark has a plurality of content information associated therewith.

5. The multi-stage watermarking process of claim 4, wherein the content of each of the content information is application specific.

6. The multi-stage watermarking process of claim 3, wherein the content information specifies at least one of static information and dynamic information.

7. The multi-stage watermarking process of claim 1, wherein the watermark specification created includes mark technology specification which describes a specific watermarking technology to be used in the step of generating the watermark.

8. The multi-stage watermarking process of claim 7, wherein the mark technology specification includes parameters needed by the specific watermarking technology during the step of generating the watermark.

9. The multi-stage watermarking process of claim 8, wherein the specific watermarking technology is at least one of DataGlyph®, DigiMarc®, Verance®'s Electronic DNA®, Alpha Tech®'s EIKONAmark®, Audiomark® and Videomark®, and Blue Spike® applications.

10. The multi-stage watermarking process of claim 1, wherein the watermark specification created includes a target object specification which describes at least one of a target object and a characteristic of the target object into which the watermark is generated.

11. The multi-stage watermarking process of claim 10, wherein the target object specification specifies at least one of a shape, color, font and resolution of an image.

12. The multi-stage watermarking process of claim 10, wherein the target object specification includes a pointer pointing to a content information which describes the content to be inserted in the watermark.

13. The multi-stage watermarking process of claim 1, wherein the watermark specification created is described using a watermark specification language and has grammar elements that: identifies the watermark specification, identifies a specific watermarking technology to be used, and identifies a target object in which the watermark is generated.

14. The multi-stage watermarking process of claim 13, wherein the watermark specification described using the watermark specification language has grammar elements that at least one of: identifies version of the watermark specification language, identifies a name of the watermark specification, and specifies technology of content information of the watermark specification.

15. The multi-stage watermarking process of claim 1, wherein the template specification generated includes a merge map associated with the watermark specification which describes where the watermark is to be merged into the target document.

16. The multi-stage watermarking process of claim 15, wherein a plurality of merge maps are associated with the watermark specification.

17. The multi-stage watermarking process of claim 1, wherein the template specification generated includes a merge technology specification which describes a specific merging technology to be used in the step of merging the watermark into the target document.

18. The multi-stage watermarking process of claim 17, wherein the merge technology specification indicates at least one of PostScript® forms, Document Object Model, XML, and MS Office® technologies.

19. The multi-stage watermarking process of claim 1, wherein the template specification generated includes merge target specification which describes at least one of the target document and a characteristic of the target document into which the watermark is merged.

20. The multi-stage watermarking process of claim 1, wherein the template specification generated is described using a watermark specification language and has grammar elements that: identifies version of the watermark specification language, provides a list of a plurality of watermark specifications to be used, and provides a mapped list of how a plurality of watermarks associated with the plurality of watermarks is to be merged with the target document.

21. The multi-stage watermarking process of claim 20, wherein the template specification described using a watermark specification language has grammar elements that at least one of: identifies the template specification, identifies a name of the template specification, provides a description of the template specification, identifies owner authorized to change the template specification, and provides comments regarding the template specification.

22. The multi-stage watermarking process of claim 1, wherein the step of generating the watermark includes the step of binding dynamic information in the watermark.

23. The multi-stage watermarking process of claim 1, wherein the step of generating the watermark includes the step of receiving and interpreting information from the watermark specification.

24. The multi-stage watermarking process of claim 23, wherein the step of generating the watermark includes the step of parsing the watermark specification to thereby obtain the information required to generate the watermark.

25. The multi-stage watermarking process of claim 23, wherein the step of generating the watermark includes the step of encoding the content that is to be in the watermark.

26. The multi-stage watermarking process of claim 25, wherein the step of generating the watermark includes the step of utilizing the specific watermarking technology to place the encoded content in a target object to be merged into the target document.

27. The multi-stage watermarking process of claim 1, wherein the step of merging the watermark includes the step of receiving and interpreting information from the template specification.

28. The multi-stage watermarking process of claim 27, wherein the step of merging the watermark includes the step of parsing the template specification to thereby obtain the information required to merge the watermark into the target document.

29. The multi-stage watermarking process of claim 27, wherein the step of merging the watermark includes the step of merging the watermarks into the target document to thereby provide the marked document.

30. The multi-stage watermarking process of claim 27, wherein the step of merging the watermark includes the step of merging the generated watermark in a target object which is then merged into the target document to thereby provide the watermarked document.

31. The multi-stage watermarking process of claim 1, further including the step of recovering the content information from the watermarked document.

32. The multi-stage watermarking process of claim 31, wherein the content information is recovered based on at least one of the watermark specification and the template specification.

33. A watermarking system comprising:

a watermark specification creation module that creates a watermark specification which describes how to generate a watermark;

a template specification generation module that generates a template specification which describes how to merge the watermark into a target document;

a watermark generation module that generates the watermark based on the watermark specification; and

a watermark merging module that merges the watermark into the target document based on the template specification to provide a watermarked document.

34. The watermarking system of claim 33, wherein the watermarked document is at least one of correspondence, books, magazines, journals, newspapers, forms, software, photographs, images, audio clips, video clips, multimedia presentations, and multimedia products.

35. The watermarking system of claim 33, wherein the watermark specification includes content information which describes content to be in the watermark.

36. The watermarking system of claim 35, wherein the watermark has a plurality of content information associated therewith.

37. The watermarking system of claim 36, wherein the content of each of the content information is application specific.

38. The watermarking system of claim 35, wherein the content information specifies at least one of static information and dynamic information.

39. The watermarking system of claim 33, wherein the watermark specification includes mark technology specification which describes a specific watermarking technology to be used to generate the watermark.

40. The watermarking system of claim 39, wherein the mark technology specification includes parameters needed by the specific watermarking technology.

41. The watermarking system of claim 40, wherein the specific watermarking technology is at least one of DataGlyph®, DigiMarc®, Verance®'s Electronic DNA®, Alpha Tech®'s EIKONAmark®, Audiomark® and Videomark®, and Blue Spike® applications.

42. The watermarking system of claim 33, wherein the watermark specification includes a target object specification which describes at least one of a target object and a characteristic of the target object into which the watermark is generated.

43. The watermarking system of claim 42, wherein the target object specification specifies at least one of a shape, color, font and resolution of an image.

44. The watermarking system of claim 42, wherein the target object specification includes a pointer pointing to a content information which describes the content to be in the watermark.

45. The watermarking system of claim 33, wherein the watermark specification is described using a watermark specification language and has grammar elements that: identifies the watermark specification, identifies a specific watermarking technology to be used, and identifies a target object in which the watermark is generated.

46. The watermarking system of claim 45, wherein the watermark specification described using the watermark specification language has grammar elements that at least

one of: identifies version of the watermark specification language, identifies a name of the watermark specification, and specifies technology of content information of the watermark specification.

47. The watermarking system of claim 33, wherein the template specification includes a merge map associated with the watermark specification which describes where the watermark is to be merged into the target document.

48. The watermarking system of claim 47, wherein a plurality of merge maps are associated with the watermark specification.

49. The watermarking system of claim 33, wherein the template specification includes merge technology specification which describes a specific merging technology to be used in merging the watermark into the target document.

50. The watermarking system of claim 49, wherein the merge technology specification indicates at least one of PostScript forms, Document Object Model, XML, and MS Office® applications.

51. The watermarking system of claim 33, wherein the template specification includes merge target specification which describes at least one of the target document and a characteristic of the target document into which the watermark is merged.

52. The watermarking system of claim 33, wherein the template specification is described using a watermark specification language and has grammar elements that: identifies version of the watermark specification language, provides a list of a plurality of watermark specifications to be used, and provides a mapped list of how a plurality of watermarks associated with the plurality of watermarks is to be merged with the target document.

53. The watermarking system of claim 52, wherein the template specification is described using a watermark specification language and has grammar elements that at least one of: identifies the template specification, identifies a name of the template specification, provides a description of the template specification, identifies owner authorized to change the template specification, and provides comments regarding the template specification.

54. The watermarking system of claim 33, wherein the watermark generation module is adapted to receive dynamic information to be in the watermark.

55. The watermarking system of claim 33, wherein the watermark generation module includes a mark specification interpreter which is adapted to receive and interpret information from the watermark specification.

56. The watermarking system of claim 55, wherein the mark specification interpreter includes a parser adapted to parse the watermark specification to thereby obtain the information required to generate the watermark.

57. The watermarking system of claim 33, wherein the watermark generation module includes a content information encoder adapted to encode the content to be in the watermark.

58. The watermarking system of claim 33, wherein the watermark generation module includes a watermark technology that places the encoded content in a target object to be merged into the target document.

59. The watermarking system of claim 33, wherein the watermark merging module further includes a template specification interpreter which is adapted to receive and interpret information from the template specification.

60. The watermarking system of claim 59, wherein the template specification interpreter includes a parser adapted to parse the template specification to thereby obtain the information required to merge the watermark into the target document.

61. The watermarking system of claim 33, wherein the watermark merging module further includes a merge technology adapted to merge the watermarks into the target document to thereby provide the marked document.

62. The watermarking system of claim 33, wherein the generated watermark is generated in a target object which is then merged into the target document to thereby provide the watermarked document.

63. The watermarking system of claim 33, further including a watermark recovery module for recovering the content information from the watermarked document.

64. The watermarking system of claim 63, wherein the watermark recovery module recovers the content information based on at least one of the watermark specification and the template specification.

65. A system for specifying, generating, and merging digital watermarks into a document at different stages of the document's life cycle comprising:

a content information means for describing application-specific content to be in watermarks, the application-specific content being generated by multiple applications and including application identification that is used during watermarks recovery;

a static information means for specifying static content that is already determined for binding into the watermarks; and

a dynamic information means for specifying dynamic content that is to be determined for binding into the watermarks by the time of at least one of generating the watermarked, and creating the watermarked document.

66. The system of claim 65, further including a mark technology specification means for describing a specific watermarking technology to be used in creating the watermarks.

67. The system of claim 66, wherein the mark technology specification means further includes parameters needed by the specific watermarking technology.

68. The system of claim 67, further including a target object specification means for providing the target object information that describes the target object into which the watermarks are generated.

69. The system of claim 65, further including a target object specification means for providing the target object information that describes the target object into which the watermarks are generated.

70. The system of claim 69, wherein data capacity of the watermarks are determined based on at least one of the content information and the target object information.

71. The system of claim 70, wherein if the data capacity of the watermark is insufficient, then the content is truncated.

72. The system of claim 70, wherein if the data capacity is insufficient, then a pointer to the content information is generated.

73. The system of claim 65, wherein the static content is bound to the watermarks prior to the binding of dynamic content to the watermarks.

74. The system of claim 65, wherein the watermark is merged into the document by at least one of manually by a user and automatically by the system.

75. The system of claim 65, further including a mark specification interpreter which supports multiple marking technologies.

76. A system for specifying, generating, and merging digital watermarks into a documents at different stages of the document's life cycle comprising:

a content information means for generating application-specific content information to be in the watermark, the application-specific content information being generated by multiple applications and including application identification that is used during watermark recovery;

a watermark specification means for generating a watermark specification having information regarding the watermark based on the content information;

a template specification means for generating a template specification having at least one merge map that describes how each watermark is to be merged into a target document; and

a watermark generation means for generating the watermark in a target object based on at least one of a watermark specification, a target object information, and dynamic content information.

77. The system of claim 76, wherein the content information also includes at least one of digital rights information, text content information, and reference to a workflow processing application.

78. The system of claim 76, wherein the watermark specification means includes a watermark specification interpreter with a parser that parses the watermark specification.

79. The system of claim 78, wherein the watermark specification interpreter obtains the application-specific content information from the watermark specification and invokes appropriate encoders to encode the content information that is to be in the watermark.

80. The system of claim 78, wherein the watermark specification interpreter supports multiple marking technologies.

81. The system of claim 76, further including a static information means for specifying static content that is already determined for binding into the watermarks; and

a dynamic information means for specifying dynamic content that is to be determined for binding into the watermarks by the time of at least one of generating the watermark, and creating the watermarked document.

82. The system of claim 81, wherein the static content is bound to the watermarks prior to the binding of dynamic content to the watermarks.

83. The system of claim 76, further including a mark technology specification means for describing a specific watermarking technology to be used in creating the watermarks.

84. The system of claim 83, wherein the mark technology specification means further includes parameters needed by the specific watermarking technology.

85. The system of claim 76, further including a target object specification means for providing the target object information that describes a target object into which the watermarks are to be generated.

86. The system of claim 85, wherein data capacity of the watermarks are determined based on at least one of the content and the target object information.

87. The system of claim 76, wherein the template specification also includes a merge technology specification that describes the specific merging technology to be use in merging the watermarks into the target document.

88. The system of claim 76, wherein the template specification also includes a merge target specification that describes the target document into which the watermarks are to be merged.

89. The system of claim 76, wherein the watermark is merged into the document by at least one of manually by a user and automatically by the system.

90. The system of claim 76, wherein the template specification is generated based on the watermark specification.

91. The system of claim 76, wherein the template specification means further includes a template specification interpreter that utilizes a parser to parse the template specification.